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ASSOCIATION OF BAY AREA GOVERNMENTS

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**Alternative Disposal Programs for
Small Quantities of Hazardous Waste**

by

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Alternative Disposal Programs for Small Quantities of Hazardous Waste

INTRODUCTION

Currently, there are few incentives to properly dispose of small amounts of hazardous wastes: individual disposal costs are too high (up to \$250 for a five gallon container) and there are few convenient collection, treatment or disposal options. This report describes alternative disposal programs that are being developed to meet the needs of small quantity generators (SQGs). Problems unique to local hazardous waste collection and disposal programs are also discussed.

LOCAL GOVERNMENT PROGRAMS FOR SMALL QUANTITY GENERATORS

Typical community collection programs are described below, followed by special innovative programs that can be implemented on a regional level.

Community Collection Programs

Because of the lack of disposal options for SQGs, an increasing number of communities across the country are experimenting with their own hazardous waste collection program. Examples of these programs are presented in Table 1. A summary of typical participation rates and waste collected at community collection programs is presented in Table 2.

A substantial amount of hazardous waste (an average of 23 drums per program) is collected and properly disposed of in community collection programs. Although a 1% average participation rate appears low, this represents a significant removal of hazardous waste from solid and sanitary waste streams. According to an ABAG Survey, about 14% of the households store hazardous materials that they want to dispose of (ABAG, 1985).

Table 1. Examples of Household and Small Business Hazardous Waste Disposal Programs

Directing Organization	Date and Description of Project	Target Population	Number of Disposers	Materials Accepted	Materials Collected
Marion County Health Department, Lebanon, KY	Jan 5-9, 1981 5 day collection from household, agricultural, & retail generators	Marion County, population-17,910	Not known	Pesticides	17 drums containing 1500 lb. of dry pesticides & 500 gal. of liquid pesticides
Project Metro, Seattle, WA	Feb 7-28, 1982 3 week collection at Fire Dept; Phone-in for pickup at home	A neighborhood of 4000 households	15 drop-off; 1 pickup; an estimated 40 recycling oil	Pesticides & solvents; oil at 6 local service stations	2 drums of pesticides (90 lb. dry & 6 gal. liquid), 4 drum of solvents (3 quarts), an estimated 40 gal. of oil
King County Health Department, Seattle, WA	Ongoing since 1982 Drop-off by appt. at 5 Health Dept. District Offices in the County	King County, population-1,270,000	Not known	Pesticides	About 10 drums per year
Department of Public Health, Lexington, MA	Oct 30, 1982 1 day collection by SCA Chemical Services at DPW yard	Lexington, population-29,479, 9673 households	94 individuals	Household hazardous wastes; no motor oil	7 drums of paint, 4 drums of pesticides, 3 drums of misc. wastes
Golden Empire Health Systems, Sacramento, CA	Oct-Dec, 1982 Collection on 10 Saturdays at a Transfer Station	Sacramento County, 267,000 households	216 individuals (an estimated 250 households)	All household hazardous wastes, up to 10 lb.	2400 lb. of oil, 7100 lb. of other wastes; by volume, 46% pesticides & cleaners, 39% paints & thinners, 11% oil, 4 % acids
Board of Health, Andover, MA	May 7, 1983 1 day collection by SCA Chemical Services	Andover, population-26,370, 8688 households	45 individuals	Not known	85 gal. of pesticides, 1 drum of oil, 3 drums of misc. wastes
Board of Health, Bedford, MA	May 14, 1983 1 day collection by SCA Chemical Services	Bedford, population-13,067, 3741 households	72 individuals	Not known	270 gal. of oil, 60 gal. of pesticides, 1 drum of solvents, 4 drums of misc. wastes
City Fire Department, Gresham, OR	May-Jun, 1983 Door-to-door pickup by Fire Department on 4 weekends	Gresham, population-33,005	Not known	Mainly pesticides, some solvents	5-6 drums of restricted pesticides and some solvents were collected & disposed of; another 30% in usable pesticides is being recycled
SCA Chemical Services (MA) Inc., Braintree, MA	May 21, 1983 1 day collection by SCA Chemical Services	Braintree, population-36,377, 11,484 households	100 individuals	Not known	270 gal. of oil, 3 drums of pesticides, 9 drums of misc. wastes
Chamber of Commerce, Fall River, MA	Jun 11, 1983 1 day collection by SCA Chemical Services	Fall River & 4 nearby towns, population-143,132, 68,892 households	20 individuals	Not known	3 drums of paint, 1 drum of pesticides, 2 drums of misc. wastes
Town of Plymouth, Plymouth, MA	Sep 24, 1983 1 day collection by SCA Chemical Services	Plymouth, population-35,913, 12,450 households	70 individuals	Not known	2 drums of flammable wastes, 1 drum of pesticides, 1 drum of corrosive wastes, 10 gal. of oil, 10 gal. of chlorine

Cape Cod Planning and Development Commission, Barnstable, MA	Oct 8-9, 1983 2 day collection by SCA Chemical Services	15 towns on Cape Cod, population-147,925	650 individuals	Not known	5735 gal. of flammable wastes, 1821 gal. of pesticides, 440 gal. of corrosive wastes, 220 gal. of oil, 240 gal. of misc. wastes
Public Health Department, Sudbury, MA	Oct 15, 1983 1 day collection by SCA Chemical Services at town yard	Sudbury, population-14,027, 4141 households	75 individuals	All household hazardous wastes	270 gal. of flammable wastes, 220 gal. of paint, 75 gal. of pesticides, 55 gal. of corrosive wastes, 30 gal. of misc. wastes
Department of Public Health, Lexington, MA	Oct 22, 1983 1 day collection by SCA Chemical Services at DPW yard	Lexington, population-29,479, 9673 households	213 individuals (Smith) 157 individuals (Drawas)	All household hazardous wastes	640 gal. of flammable wastes, 290 gal. of pesticides, 140 gal. of oil, 110 gal. of corrosive wastes
Town of Reading, Reading, MA	Oct 22, 1983 1 day collection by SCA Chemical Services	Reading, population-22,678, 7308 households	Not known	All household hazardous waste	1100 gal. of paint, 305 gal. of pesticides, 130 gal. of flammables, 50 gal. of corrosives, 30 gal. of oil, 10 gal. of chlorine, 5 gal. of asbestos, 35 gal. of misc. wastes
City of Palo Alto, Palo Alto, CA	Oct 28 & Nov 5, 1983 Collection on 2 Saturdays at Recycling Center	Palo Alto, population-56,040	About 150 families	All household hazardous wastes	2474 lb. in 28 drums, including 996 lb. of paint, 533 lb. of pesticides, 420 lb. of solvents, 130 lb. of oxidants, 64 lb. of oil, 58 lb. of cleaners, 16 lb. of acids
Town of Concord, Concord, MA	Oct 29, 1983 1 day collection by SCA Chemical Services	Concord, population-16,293, 5204 households	Not known	Not known	715 gal. of flammable wastes, 100 gal. of pesticides, 55 gal. of corrosive wastes, 25 gal. of chlorine
Town of Bedford, Bedford, MA	Nov 5, 1983 1 day collection by SCA Chemical Services	Bedford, population-13,067, 3741 households	30 individuals	Not known	330 gal. of flammable wastes, 55 gal. of oil, 55 gal. of corrosive wastes, 24 gal. of pesticides
Town of Dartmouth, Dartmouth, MA	Nov 5, 1983 1 day collection by SCA Chemical Services	Dartmouth, population-23,966, 7875 households	80 individuals	Not known	275 gal. of paint, 230 gal. of flammable wastes, 220 gal. of corrosive wastes, 180 gal. of pesticides
Town of Westford, Westford, MA	Nov 5, 1983 1 day collection by SCA Chemical Services	Westford, population-13,434, 3954 households	Not known	Not known	1356 gal. of flammable wastes, 180 gal. of pesticides, 90 gal. of oil, 55 gal. of corrosive wastes, 24 gal. of asbestos
County Environmental Health Services, San Bernardino, CA	Mar 24, 1984 1 day collection at city yard	San Bernardino, population-30,000	27 individuals	All household hazardous wastes	10 drums containing 175 gal. of liquid waste and 76 lb. of dry waste

Table 2

Typical Participation and Amount of Waste *
Collected at Community Hazardous Waste Programs

	Average Disposal Per Household (lbs/household)	Total (lbs unless otherwise specified)
Participating Households	--	125 households
Participation Rate	--	1% of target population
Waste Collected		
Paints	11.0	1278
Pesticides	5.1	1090
Oil	10.3	1082
Solvents	2.3	407
Total	31.4	3612 (22.7 drums)

* Mean values where data are available from programs listed in Table 2.

Source: Cohen, 1984

While most community programs to date have been pilot, many cities and counties are planning to continue these services on an ongoing basis. Communities that have repeated their collection programs have experienced an increase in participation rate and/or amount of waste received. General features of community programs are summarized below:

- o The most popular type of program involves setting up a collection area where the public can come and drop off their hazardous wastes. Communities usually operate one site; however, several locations are used for large geographical areas. Collection programs operate on the average of five days a year, ranging from one day service to ongoing collection programs. In conjunction with collection centers, telephone and door-to-door pickup services have been successfully conducted in San Diego, Seattle, and Victoria, British Columbia.
- o Most programs accept only household wastes, with a few programs successfully receiving wastes from businesses (e.g. San Diego, Florida, Victoria, British Columbia).
- o All services are provided free of charge to users, although one community charged for wastes over five lbs or five gals (Lexington, Mass.).

- o While restrictions are specified in some areas, most programs do accept all wastes arriving at collection centers. (Failure to do so may cause illegal dumping nearby). Restrictions include the following:
 - limit of five gal or 120 pounds dropped off per household,
 - exclusions for certain types of wastes such as pressurized gas cylinders, explosives, radioactive materials, munitions, fireworks, oil, antifreeze, and PCB, and
 - wastes must be delivered in their original containers and not leaking.
- o Inevitably, extremely hazardous and banned hazardous materials appear, such as picric acid, DDT, parathion, and cyanide.
- o Most of the collected waste oil is recycled, as are some of the solvents and paints. A few programs send their waste to an incinerator. All other wastes are disposed of at Class I landfills.
- o Program costs range from a reported \$2,400 for a one day program to \$65,000 for a one year program in San Bernardino County. An average cost for a four to five day collection program is \$20,000 to \$30,000. Cost data for ongoing programs are difficult to determine since services for pilot programs are often donated by waste haulers, disposal companies, and local industry. Disposal costs at Class I landfills are increasing, making it difficult to budget costs.
- o Funding sources are typically local governments with some donations by local businesses, in-kind services, and state grants.
- o Educational and promotional materials include fliers, pamphlets, posters, slide presentations, public service announcements, and special school curricula. (Golden Empire Health Planning Center, 1984)

In the San Francisco Bay Area, several city- and county-wide programs have been conducted with, at times, overwhelming response. Nearly 700 drums of household hazardous waste have been sent to Class 1 disposal facilities in the last twelve months. A brief listing of these programs is presented in Table 3. The number of participants and amount of waste received have been greater in the Bay Area than reported in Tables 1 and 2. While most of these programs are pilot, the City of Palo Alto is implementing a permanent collection service at their recycling center. Additional new household programs are being planned throughout the region.

Table 3
Examples of Community Waste Collection Program

Sponsoring Jurisdiction	Schedule	Collection Site	Number of Participants	Participation Rate ^a , %	Total Waste Collected	Cost
Albany	one Sunday	race track parking lot	105	1.5	50 drums	\$10,281
Contra Costa County	one Sat, 10-2	recycling center and county parking lot	250	0.1	70 drums disposed, 2 drums oil and 40 gals paint recycled	\$12,000 ^b
Cupertino	one Sat, 9-3	college parking lot	125	1.0	43 drums and recycled oil	\$14,000
Mountain View, Los Altos, and Milpitas	two consecutive Sats, 10-4	city corp. yard	233	0.5	131 drums and recycled oil	\$21,000
Oakland, League of Women Voters	one Sat. 10-4	fire training center	362	0.2	64 drums, 1 bin of about 2000 containers misc. paints	\$ 4,700
Palo Alto	two consecutive Sats, twice annually	recycling center	150	0.6	85 drums	\$30,000
San Francisco, Sanitary Fill Co.	one Sat, 10-3	solid waste transfer facility	160	0.4	63 drums	\$40,000
San Mateo County	one Sat, 10-4	industrial parking lot	>200	0.1 ^c	96 drums	\$27,275
Santa Rosa, Redwood Empire Disposal Co.	one week, part of annual spring cleanup, daily 8-6	fairgrounds parking lot	587	1.7	49 drums disposed 10 drums oil recycled	\$15,700
	second sat, 10-3	city corp. yard	89	0.3	16 drums disposed, 3.5 drums oil recycled	\$ 3,200

^a Percentage of total households within jurisdiction. Based on ABAG 1980 population profiles.

^b Does not include donated waste packaging, hauling and disposal services.

^c Based on target population of central and southern San Mateo County.

Most of the Bay Area programs are designed to collect only household hazardous wastes, excluding explosives, radioactive and commercial wastes. Community based programs that will address commercial SQGs are limited: Palo Alto is considering the inclusion of businesses in their program, and ABAG and Alameda County will be developing a pilot collection system for both households and businesses.

Mobile Collection Program

The State of Florida has initiated a three year mobile collection program to collect waste from households and small businesses. Two 45-foot trailers are moved from county to county throughout the State for community Amnesty Days collection programs. Workshops are first initiated in a county whereby local officials and interested parties select specific sites (e.g. malls, parking lots, stadiums) for the mobile units to be set up. Logistics are worked out for every area in a cooperative effort between state and local representatives. A private hazardous waste contractor is hired to package, transport and dispose of the waste.

While most communities shy away from accepting wastes from small businesses, Florida has had no problems accepting their wastes. About 57% of the wastes collected are from businesses, which represent 20% of the number of participants. Individual drop offs are limited to 1 drum or 450 lbs. (which is equivalent to about 3 lab packed drums). Radioactives, biological wastes, explosives, gas cylinders, aerosol cans and latex paint are not accepted. In two months in 1984, about 250,000 pounds of waste were collected from 2,513 households, 277 businesses, 50 schools, and 86 governmental agencies. Solvents and paint products were recycled, with the remaining waste landfilled or incinerated. Costs for the two months of operation were \$550,000.

AB 1655 has been introduced into the State Legislature calling for a similar Amnesty Day Program to be conducted on a one time basis in California. Such a program would be conducted by the Department of Health Services in conjunction with individual counties. However, plans have not been made for the use of a mobile collection program.

Regional Collection Programs

Two highly successful programs outside the United States employ regional collection approaches.

In Denmark, the Danish Municipal Councils have set up centrally located and accessible local collection stations for private citizens. Local collection stations usually cover a single municipality. Central collection stations are established to receive wastes from local stations from several municipalities. At the central collection stations wastes, oils, and chemicals are separated and prepared for transport. When enough waste has been received to fill a freight car, the waste is transferred to the treatment plant in Kommunekemi. Here wastes are recycled, treated, incinerated, or landfilled in a controlled site.

In Victoria, British Columbia, the Ministry of the Environment has funded a number of Regional Special Waste Storage Facilities. The Regional Special Waste Storage Facilities are open to the public during regular working hours, although the practice of making an appointment to drop off the waste is encouraged. In some instances, the storage facilities' personnel will pick up the waste. When the waste is brought to the facility, Ministry of the Environment personnel sort and package the waste. Most household quantities of hazardous waste are accepted free of charge. A charge is levied on quantities greater than one drum.

Each Regional Storage Facility can store approximately 10 to 15 drums. When these drums are full, they are transported to a larger storage facility in the center of the province. The central facility has the capacity to store 200 drums. Whenever a truck load of waste (about 70 drums) is accumulated, the waste is transported for disposal to a Class I landfill in Oregon. There are currently five Regional Storage Facilities and three additional facilities will open in 1985. The capital cost for this program is \$615,000 with an annual operating cost of \$70,000 (in Canadian currency).

Educational Programs

The key to any of the alternative programs for SQGs is effective education. Findings of the ABAG survey of households and businesses support the need for educational programs targeted specifically at SQGs. SQGs are often unaware of their inhouse use of hazardous materials, improper disposal of hazardous wastes, waste reduction techniques and applicable regulations. They disassociate themselves from possible environmental and public health problems. As mentioned above, education materials are usually developed and disseminated as part of the publicity for local community collection programs. Most of these are directed to households.

Studies show that educational programs for business SQGs have improved handling, storage, recycling and disposal practices. The most effective approach includes the distribution of information pamphlets and follow-up personal contacts by health or fire inspectors offering advice and technical assistance. This is the approach used in the State of Michigan and in the South Tacoma Channel area in the State of Washington. In California, a growing number of counties and cities initiating hazardous material/waste inspection and enforcement programs are using a similar approach. The State Department of Health Services is relying on this approach to handle the SQG problem by entering into Memoranda of Understanding with individual counties to conduct local hazardous waste programs. In these county programs, business SQGs are identified (usually based on SIC and business directories) and inspectors are sent by the county to insure proper waste management practices.

With additional Section 205(j) grant funds from the State Water Resources Control Board and the U.S. Environmental Protection Agency, ABAG will be working with Alameda County to develop educational workshops to augment inspection programs. Such educational programs must go hand in hand with the offering of special collection programs for businesses.

Congress has appropriated some funding under Section 8001 of the Resource Conservation and Recovery Act for assistance to small quantity generators. Some funding is being provided for household collection programs. However, the EPA has not allocated any funds for educational programs for business SQGs in California.

PRIVATE PROGRAMS FOR SQGs

Small scale generators of hazardous waste are faced with the same responsibilities of properly managing their waste as larger generators. While the scale of such management programs are quite different, the basic approaches are the same: good housekeeping practices, understanding the hazardous nature of their wastes, regulatory compliance, waste reduction, recycling, treatment and proper disposal. The key to the careful management of hazardous wastes is routine waste audits. Through the audit process, opportunities for reducing waste volumes, changing processes to eliminate hazardous waste productions, and opportunities for recycling may be identified.

In response to the high costs and liabilities associated with the transportation and disposal of hazardous waste, the market is gradually responding with more cost effective technologies for small amounts of hazardous waste. This includes onsite or portable recycling and physical-chemical treatment processes. In addition, new products and processes are being developed which are less hazardous (e.g. lead free batteries and dry stripping processes for removing paint from automobiles).

The cost of managing small quantities of hazardous waste may be as much as \$5,000 per year. This includes cost for waste testing, treatment systems, transport and disposal fees. These basic costs, which cannot be avoided as long as hazardous wastes are generated, must be considered as one of the many costs of business operations. Various approaches are discussed below which can help minimize hazardous waste management costs for the SQG. Experience indicates that small quantity waste management can be accomplished without putting private firms out of business. (Waste Systems Institute of Michigan, Inc., 1984) .

Transfer Stations

A few hazardous waste haulers have established permanent transfer stations where wastes are brought for temporary storage until a full load of waste is accumulated for transport to a treatment or disposal facility. These facilities are specially designed to safely segregate and store wastes, providing double and sometimes triple containment measures in case of a spill. Since receiving small amounts of hazardous waste alone is not a profit making venture, transfer stations operators usually provide consultation, packaging, and pick-up services for generators.

When conveniently located, transfer stations can greatly reduce the unit disposal cost for small businesses. At a Class I landfill, costs for disposing a one-gallon container are typically one half the cost of

disposing a 55 gallon drum. About 20 one-gallon containers can be lab packed into a 55 gallon drum. In addition, one drum costs about \$350 to be transported and disposed, while 80 or more drums cost \$50 to \$120 per drum. Present costs for dropping off a one-gallon container to a transfer facility is about \$7-10/gal, compared to about \$150-\$250 at a landfill (Oliva, 1985). As inspection and enforcement actions require small to medium sized businesses to be more accountable for the disposal of their wastes, there will be a greater demand for these services. This is particularly important since most businesses in the ABAG survey generally were not interested in paying more than \$25 a month to dispose of their hazardous waste (ABAG, 1985).

Presently, American Environmental Corporation operates a transfer station in Sacramento. This has been a successful operation that recently received a permit to construct an incinerator to treat biohazardous wastes. Bay Area Environmental operates a transfer station in Richmond. A second transfer station is being established in Santa Clara by Safety Specialists. Other stations are being considered in San Francisco and Santa Rosa.

Milk Run Pickups

On a milk run pickup, small quantities of hazardous waste from several different generators are loaded onto a single truck. A hazardous waste transporter may schedule a special route to pick up small quantities, or may pick up small quantities when in the area on other business. Milk run pickup locations need to be convenient to the transporter's regular travel routes, but need not be clustered together. Several hazardous waste transporters already do some milk run pickups.

From a transporter standpoint, a milk run pickup requires careful organization of waste containers to avoid high hazard combinations of materials. Advanced planning and scheduling is essential. Sometimes it may be necessary for the small quantity generator to wait a week or so for the pickup, as opposed to immediate pickup upon a telephone call.

The milk run pickup does not lower the cost of handling the small quantity at the disposal facility in most cases, since each barrel or container must be examined prior to disposal. Nevertheless, milk run pickups have been reported to reduce hazardous waste transport costs by 50% or more. Again, rather than paying \$350 or more just to transport a single drum of hazardous waste, some transporters are able to handle drums at a cost of \$60 to \$120 each (Waste Systems Institute of Michigan, Inc., 1984, and Oliva, 1985).

Blending During Transport

Blending involves the mixing of a similar type of hazardous waste from different generators into a single tank. In setting up a commingling pickup, extreme care must be taken to insure that the waste types are similar (similar types of businesses and wastes) and to insure careful on-site monitoring of the waste at the site of generation.

When the wastes are commingled in a single tank, a single "mixed" hazardous waste is created. The transporter becomes the generator, and must complete a manifest on the load. Some generators are reluctant to lose the identity of their own waste and some transporters are not willing to assume responsibility as the new generator.

Commingling of waste oils is a common practice. More attention is being given to commingle solvents from similar types of businesses, such as automobile dealerships, body shops and rust-proofing shops. By applying special precautions in solvent handling at businesses, generators can minimize contaminants in the waste.

Although the specific application of commingling services is, of necessity, restricted to similar types of oils or solvents from similar businesses, it offers significant cost-saving advantages to small quantity generators. Moreover, commingling solvents provides an opportunity for reclamation of solvents which otherwise would be disposed of without reclamation.

Generator Cooperatives

The purpose of a generator cooperative is to take advantage of the buying power of a number of small businesses. Collectively, a group of businesses, such as a single trade association, may be able to obtain a group rate for transportation and disposal services which is significantly lower than services available to individual generators. Most importantly, the cooperative can purchase special treatment and recycling equipment to be rotated for use among members. Generator cooperatives may also be able to offer member services (such as organization and management of a milk run pickup) to save members costs. Cooperatives are also able to provide educational materials to members on regulatory compliance.

Generator cooperatives have been proposed and several are in operation throughout the country. For example, in New England, a dry cleaners association has formed a special cooperative to manage waste solvents. Transport and disposal costs for individual businesses have been reduced by almost 70%, and costs per drum have been \$50-\$100 rather than \$300-\$400.

Waste Collection by Chemical Distributors

Some chemical and solvent distributors are now offering hazardous waste collection and transport services to their customers. The distributors typically pick up hazardous wastes at the same time that fresh chemicals or solvents are delivered, thus saving hazardous waste transport costs. Hazardous wastes may then be transported to a licensed storage, treatment, recycling, or disposal facility.

The waste collection services offered by chemical distributors provide some of the same cost-savings as milk run pickups. A Michigan chemical distributor has reported that transportation and disposal costs per drum average \$75-\$80 depending on the type of waste and assuming that a full

truckload (70 drums) can be picked up in the vicinity (Waste Systems Institute of Michigan, Inc., 1984).

ABAG's survey of selected SQGs revealed one solvent distributor that services gasoline stations and other businesses where degreasing of automobile parts is undertaken. The company leases solvents and parts cleaning machines for a fee. Spent solvents (hazardous wastes) are picked up and taken to reclamation facilities. Some solvent reclamation and recycling companies across the country are offering similar solvent pickup services to small quantity generators.

PROBLEMS AND CONSIDERATIONS

Several potential problems that need to be considered whenever designing special collection programs for SQGs are described below. Temporary household collection programs are becoming popular and often receive special considerations and variances. However, when establishing permanent programs for both households and businesses, these problems can become strong disincentives. When given careful attention, none of these factors should create insurmountable problems.

Permit Requirements

In California, a site which receives hazardous waste from more than one producer is considered an offsite hazardous waste facility. Operations involving such a site must have a permit or permit variance from the State Department of Health Services (DOHS). Communities and organizations that sponsor collection programs for household hazardous wastes typically submit an operation plan to DOHS and receive a permit variance. Operation plans generally describe the facility design, wastes to be accepted/excluded, personnel, contingency plans, insurance provisions, storage, transport and general operation procedures. Guidelines for establishing household hazardous waste collection programs are being prepared by DOHS. While pilot household programs have received variances in the past, permanent programs and those that include businesses may require a permit.

Generator ID numbers must be obtained from DOHS for each collection site. As a generator of hazardous waste, a community (or whomever is designated as generator) is legally responsible for handling storage, transport and disposal of all hazardous waste received. Communities may apply for generator status themselves, or they may arrange for their hazardous waste contractors to be the designated generators. In the past, the DOHS agreed to be the legal generator for a few community collection programs. It is doubtful that they will continue this policy.

Some communities have hesitated to accept the liabilities of being a hazardous waste generator. However, if they own and operate a municipal landfill or wastewater treatment plant, they may be assuming greater future liabilities from the continued improper disposal of SQG wastes. The California Department of Health Services and the U.S. Environmental

Protection Agency have indicated that, in the event of a release from the ultimate disposal facility, they will not take enforcement actions against communities that have State approved household hazardous waste programs (Deland, 1984 and Bufton, 1985).

Facility Siting

The location of facilities to receive small amounts of hazardous waste needs to be convenient and accessible, yet minimize the potential threat to human health or the environment. ABAG's household survey indicates that most people are willing to travel up to 20 miles to dispose of their household hazardous wastes. (Most people in San Francisco are willing to travel up to 10 miles.) About 70-90% of the surveyed households said they would travel up to five miles.

The siting of a permanent hazardous waste facility such as a transfer station usually requires a local land use permit. This authority gives the community substantial influence on the type of permitted development, following objectives described in the General Plan and reflected in zoning ordinances.

The California Environmental Quality Act (CEQA) requires any public agency which either permits or proposes a discretionary project (requiring judgment on the part of the agency) to consider the environmental impact of that project. If the project has a significant potential effect on the environment, an environmental impact report must be prepared.

State hazardous waste facility permits, local land use permits and the CEQA process elicit public participation. Local involvement is crucial to the siting process. This has been demonstrated by the lengthy litigation that has resulted from siting a transfer station in Richmond. Siting complaints from a local citizen group limited full operation during the transfer facility's first year.

Strong public relations campaigns can minimize public opposition and facilitate the siting process. For example, a private hazardous waste management firm trying to establish a permanent transfer facility donated packaging, hauling, and disposal services for a community household collection program. This provided educational services, showed participants how a transfer station operates, and demonstrated community spirit.

Because of the difficulty in siting new facilities, when problems do arise at a hazardous waste facility, land use planners should consider the feasibility of upgrading that facility rather than closing it down.

Public Awareness

It should be stressed that publicity and education are essential to the successful development and operation of SQG programs (ongoing or

temporary). The general public and business need to be aware of the potential dangers from unsafe use and disposal of hazardous materials/waste. Education programs that describe proper hazardous material management practices and safe substitutes will reduce the amount of hazardous waste to be collected for recycling, treatment or disposal. People need to be informed of collection and recycling services available to them.

Personnel and Equipment

The personnel and equipment needs of SQG collection programs are so specialized that most local programs contract with reputable private companies for packaging, transport, recycling, treatment, and disposal of hazardous wastes.

Personnel who accept, sort and package waste at a collection site for transport to a treatment, storage or disposal facility must be trained and knowledgeable in the incompatibility of various classes of waste. Some collection programs arrange for several technicians with chemistry and on-the-job experience to receive wastes. At least one hazardous waste professional/chemist needs to be on hand to classify wastes and to perform some identification tests on unknown items. Personnel who package the waste must be able to comply with Federal Department of Transportation placarding and labeling requirements and manifest regulations. Personnel who transport waste to a TSD facility must be a State registered hazardous waste hauler.

Personnel need to be trained in proper emergency response to fires, explosions, spills and accident prevention. Protective equipment needs to be on site and all personnel need to be trained in its proper use. At least one trained person needs to be on site to perform general first aid and decontamination. All local emergency response personnel should be notified prior to beginning waste collection programs. They often provide technical assistance during collection programs.

Additional equipment that needs to be on-site during collection programs includes decontamination equipment, spill containment materials, communication devices, and proper packaging materials.

Recycling/Treatment

It is estimated that up to 30% of the wastes collected in household collection programs can be recycled (Cohen, 1984). The savings in disposal costs alone are substantial (at over \$150/drum) and warrant the effort to recycle, even though there may be no revenues received.

Waste oil is one of the most common hazardous wastes and the easiest to recycle. At about 25 cents per gallon, most businesses already recycle their oil. Less than 40% of the households that change their motor oil actually recycle it. Curbside oil recycling programs are being successfully operated in Palo Alto, Sunnyvale and Santa Monica.

Paint is the second most common type of hazardous wastes received at community collection programs. Since there does not appear to be a commercial market for small amounts of paint, near full cans of paint can be passed on to possible local users such as artists, schools and recreation departments. Cans with residual latex paint can be air dried and sent to a solid waste landfill. Similarly, collection programs can apply for permit variances to treat their wastes and then solidify latex based paints with special absorbents. Some recycling projects do accept full cans of paint for resale (e.g., Urban Ore, Berkeley).

Non-restricted pesticides can often be recycled through county agricultural commissioners. Unused pesticides can sometimes be passed on to small commercial growers and local public works departments.

Offsite commercial recycling of small amounts of other chemical wastes is difficult because of varying types, quantities, and degree of contamination. Mixed solvents are expensive to recycle, requiring a series of distillations and often incineration in a small rotary kiln. Therefore, onsite recycling is more efficient for businesses with large enough operations to warrant recycling equipment. In smaller businesses, source separation of wastes and the alternative collection programs described above need to be considered.

Hazardous Waste Tax

Designated generators of over 500 pounds of hazardous waste per year are taxed by the California State Board of Equalization. Local health officers or county agricultural commissioners who collect hazardous waste through voluntary non-industrial hazardous waste collection programs are exempt from taxation provided that the amount of waste collected is less than 1,000 kg/month. This translates to about five to 15 drums, based on packed and liquid wastes respectively. The typical 23-drum community collection program easily exceeds this in a one-month period. (Pro-rating volumes throughout the year could possibly exempt communities from this tax.)

The tax rate varies each year depending on the volumes and types of waste generated statewide. The hazardous waste tax rate for 1984 ranged from \$3 to \$40 per ton. Based on the amounts of waste collected to date, designated generators for community household collection programs could be taxed from \$6 to \$180 depending on the classification of wastes received. Most communities or subcontractors designated as generators would be taxed less than \$15.

CONCLUSIONS

The amount of hazardous waste collected from pilot SQG collection programs represents a substantial removal of hazardous waste that might otherwise be improperly disposed of to sanitary sewers, solid waste landfills, storm drains, backyards, and vacant lots. The continued success of repeated SQG programs indicates that both household and business programs need to be

established on an ongoing basis. Experience indicates that waste management can be accomplished without putting small firms out of business. Firms can meet the requirements under the law without extensive office time or extremely high cost.

Several alternative approaches are available for managing waste from household and business SQGs. Given the widespread use of hazardous materials and the present lack of available disposal options, all communities should consider these programs.

The approach to SQG programs needs to be widespread so that no industry or region is at a competitive disadvantage for complying with hazardous waste requirements.

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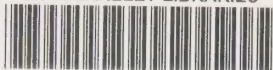
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